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EXAMINER	
FONTAINE, MONICA A	

ART UNIT	PAPER NUMBER
1732	7

DATE MAILED: 06/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

mx. 7

Office Action Summary	Application No.	Applicant(s)	
	09/987,345	KONNO, TAKESHI	
	Examiner	Art Unit	
	Monica A Fontaine	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

This office action is in response to the Amendment filed 24 March 2003.

The following rejections have been withdrawn:

A. 35 USC 103(a) over Shimizu et al. (U.S. Patent 4,879,077), in view of Imatomi et al. (U.S. Patent 6,321,940): Claims 1-8, 10-12

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by Imatomi et al., hereafter "Imatomi," as set forth in Paper No. 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al., hereafter "Shimizu," in view of Yamazaki (U.S. Patent 4,540,359).

Regarding Claim 1, Shimizu shows the basic process, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder

(Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, lines 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary synchronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Yamazaki shows that it is known to retract the screw while rotating it (Column 6, lines 29-33). Yamazaki and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Yamazaki, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 2, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation

and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 3, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, lines 60), comprising the steps of, defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not

explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Yamazaki shows that it is known to retract the screw while rotating it (Column 6, lines 29-33). Yamazaki and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Yamazaki, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 4, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed

during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 5, Shimizu shows the basic process as claimed, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, line 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Yamazaki shows that it is known to retract the screw while rotating it (Column 6, lines 29-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Yamazaki, in Shimizu's molding process in order to melt and measure the material more efficiently. Furthermore, Shimizu shows the basic process as claimed as discussed above, but

does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 6, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 7, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of

the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, line 60), comprising the steps of defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Yamazaki shows that it is known to retract the screw while rotating it (Column 6, lines 29-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Yamazaki, in Shimizu's molding process in order to melt and measure the material more efficiently. Furthermore, Shimizu shows the basic process as claimed as

discussed above, but does not explicitly show varations of the synchronization of the screw rotation and linear movement. However it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 8, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show varations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 9, Shimizu shows that it is known to control an injection molding machine in order to control the movement of a molten resin in a heating cylinder of the injection molding machine (Column 2, lines 18-26), the injection molding machine including a screw

arranged within the heating cylinder to be rotatable and to be linearly movable (Column 2, lines 43-48) and having a flight of pitch P (Column 2, line 51), the molten resin being moved in a forward feeding direction during a plasticization process and an injection process (Column 2, lines 43-65). Shimizu does not show rotating the screw while moving it backwards after completion of the measuring process or the injection process. Yamazaki shows that it is known to retract the screw while rotating it (Column 6, lines 29-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards after an injection process, as in Yamazaki, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 10, Shimizu shows the process as claimed as discussed above, including showing that it is known to control an injection molding operation by performing a plasticization/measuring process and an injection process (Column 2, lines 18-26). Shimizu also shows that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and to define a rotation speed of the screw by dividing the linear (backward, as in Yamazaki) speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is

more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 11, Shimizu shows the process as claimed as discussed above, including showing that it is known to define a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). Furthermore, the examiner also notes that Shimizu does not explicitly define a synchronization ratio, as used in the formula in Claim 11. However, since the synchronization ratio of Claim 11 cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.).

Regarding Claim 12, Shimizu shows the process as claimed as discussed above, including showing that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention

was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Response to Arguments

Applicant's arguments regarding the rejection of Claim 9 filed 24 March 2003 have been fully considered but they are not persuasive.

Applicants contend that the Imatomi document does not teach the claimed invention because his screw retraction does not take place after completion of the plasticization process or the injection process. This argument is not deemed persuasive because Imatomi does disclose screw retraction after plasticizing and metering pellets of resin (Column 6, lines 20-26). Furthermore, Imatomi also discloses screw retraction after an injection process because as a result of the cyclic nature of injection molding processes, it is possible to say that a screw is retracted after the injection process, for example, by identifying the beginning of a cycle with an injection process and ending each cycle with a plasticization/metering process followed by screw retraction. Although Imatomi shows both processes, it is noted that due to the claim language, it is possible to reject the claim with prior art having screw retraction after a plasticization process OR an injection process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A Fontaine whose telephone number is 703-305-7239. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill L. Heitbrink can be reached on 703-308-0673. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9310 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

maf
May 30, 2003

Jill L Heitbrink

JILL L. HEITBRINK
PRIMARY EXAMINER
ART UNIT ~~137~~ 1732

6/2/03